Senate Bill 5X Outdoor Lighting Standards Template to be used to Propose Measures

February 5, 2002

Purpose

This document is a template of the information necessary to complete a preliminary evaluation of proposed measures to be included in the new SB 5X Outdoor Lighting Standards. Information provided through this template will be used to identify possible new outdoor lighting requirements to be released for comment in July 2002.

Additional information and analysis will be needed for measures that pass the initial screening. Additional work would include a life cycle cost analysis, development of calculation procedures, preparation of explanatory material, and a more thorough investigation of the items in this template.

Definition of Outdoor Lighting

Outdoor lighting includes but is not limited to lighting in unconditioned buildings, lighting that is mounted on the exterior of buildings, lighting that is exterior to buildings but controlled from the electrical panel of the building, and lighting that is not controlled from a building. Examples of outdoor lighting include lighting in unconditioned warehouses and other unconditioned building spaces, lighting for parking lots, signage and advertising, car lots, and service stations, street and highway lighting and other outdoor lighting systems. These different types of outdoor lighting may currently be regulated in the California Electrical Code, the California Fire Code, or in other rules of state and local government agencies.

Template Subheads

A separate document should be produced for each measure proposed for consideration. The document should use all of the following subheads. A paragraph follows each subhead, which expands on the information to be provided.

Proposer Name

Identify the name(s) of the individual(s), companies and the trade associations proposing this measure.

Measure Title

Propose a descriptive title for the measure in eight words or less.

Description

Describe the proposed measure and how it would apply to outdoor lighting systems subject to regulation by the California Energy Commission or other enforcement mechanisms. Describe the outdoor lighting types or systems where the measure would most likely apply. Provide appropriate details. Keep the description brief – just a single paragraph, if possible.

Benefits

Describe the benefits of the measure, such as energy savings and electricity peak demand reduction. Identify other benefits, such as increased security or safety, reduced glare, reduced light trespass and light pollution, reduced maintenance costs, environmental benefits, health and safety benefits.

Environmental Impact

Does the measure have any potential adverse environmental impacts? Does it have an impact on drivers, light pollution and trespass, the night sky, and public safety? Does it affect atmospheric emissions (including ozone-depleting gases)? Are there environmental or energy impacts associated with material extraction, manufacture, packaging, shipping to the job site, installation at the job site, or other activities associated with implementing the measure?

Enforcement Mechanism

Describe the enforcement mechanism necessary for this measure. The Title 24 Building Energy Standards are enforced through building permitting process. However, many outdoor lighting systems may be outside of the traditional building permitting process, such as advertising, billboards, lighting in public parts, street and highway lighting. Please indicate an appropriate enforcement mechanism for the proposed measure. Options other than Title 24 include: the state appliance standards (Title 20), which are enforced at point of sale; developing a model standard for volunteer adoption by cities, counties or state agencies; or for some measures new legislation may be required.

Enforcement Options

Title 24

If the proposed measure is expected to be included in the Title 24 energy efficiency standards, please indicate if the measure would likely be a mandatory measure, a prescriptive standard or a compliance option.

Mandatory Measure	Mandatory measures that must always be satisfied regardless of the compliance option chosen (prescriptive or performance method).
Prescriptive Requirement	Prescriptive requirements set limits on lighting power or other factors, but some flexibility is provided through tradeoffs or performance methods. It is also possible to propose multiple prescriptive options or packages, which is another way to provide design flexibility.

Compliance Option	Compliance options are not required by the prescriptive or mandatory measures, but provide an alternative means of compliance.

Title 20 Appliance Standards

Another enforcement mechanism is to include the measure in the California appliance standards. The appliance standards are enforced at point of sale, rather than at the building department counter. They affect all outdoor lighting. Appliance standards typically have a phased implementation timetable to give manufacturers time to comply.

Model Standard

A great deal of outdoor lighting is installed by cities, counties and state agencies. Title 24 does not apply to these groups, since a building permit is not required for their public works projects. A possible regulatory approach for these outdoor lighting applications is for the CEC to develop a model standard which can be adopted by affected cities, counties and state agencies on a voluntary basis. The standard could include advertising billboards as well as public right-of-way lighting and outdoor lighting in public places.

State Legislation

For some proposed measures, none of the options listed above may be appropriate and the recommended course of action would be to recommend a change in the California Administrative Code. Such a change would require that legislation be introduced and passed by the California Legislature and signed by the Governor.

Regulatory Approaches

With any of the enforcement mechanisms listed above, criteria can be developed in many different ways. Please indicate the scope of the proposed design criteria by indicating the factors from the list below that might be the subject of regulation (expand the list if necessary).

Lighting Power Density	Limits would be placed on the amount of power that can be used for the lighting application.
Lighting Controls	Certain types of controls would be required or control functions would be required.
Glare	Limits would be imposed on glare, especially as experienced from roadways. Glare is the luminance ratio of the bright point compared to the background.
Marketing	Specify the maximum amount of lighting (illuminance, luminance or other) allowed for marketing and sales.
Equipment Specifications	Require that outdoor lighting equipment have a specific cutoff angle, a minimum efficacy or efficiency, maximum mounting height, etc.
Illuminance Levels	Limit the amount of illumination that can be provided for specific lighting applications, e.g. parking lots might be limited to a certain footcandle level.
Light Pollution	Specify the acceptable quantity of light pollution for a specific area.
Light Trespass	Specify the acceptable quantity of light trespass for a specific area or type of area. Does this measure designate environmental zones, often referred to in international and other standards as "E1-E4"?
Hazard Lighting	Limit the maximum allowed illumination or luminance for safety hazards.
Uniformity	Specify illuminance or luminance variation throughout an area.

For each of these factors, please indicate a metric that would be used to express the regulation and how it would be measured and enforced. For instance, for lighting power density, the metric might be W/ft_.

Considerations for Proposed Lighting Technologies

If the proposed Standards change requires a specific type of equipment or product, then information should be provided on cost, availability, useful life, persistence, and maintenance. See below.

Measure Availability and Cost

Identify the principal manufacturers/suppliers who make the measure (product, technology, design strategy or installation technique), and their methods of distribution. Is the measure readily available from multiple providers? Comment on the current ability of the market to supply the measure in response to the possible Standards and the potential for the market to ramp up to meet demand associated with the possible Standards. Identify competing products.

Define the baseline condition. For life cycle cost analysis, what would the measure be compared to, e.g. the current standards or common practice? Be specific.

In general terms, how much does the measure cost compared to the baseline condition? Comment on both initial cost and maintenance costs. Are performance verification or commissioning costs significant?

Useful Life, Persistence and Maintenance

Describe the life, frequency of replacement, and maintenance procedures related to the measure. How long will energy savings related to the measure persist? Is persistence related to performance verification, proper maintenance and/or commissioning? If there are issues related to persistence, how can they be addressed? (See topic on performance verification.)

Performance Verification

Does the technology or design strategy need performance verification or commissioning to insure that it is properly installed and/or performing as designed? How are the energy performance, useful life and persistence of savings affected by performance verification or commissioning? What specific performance verification measures or requirements are needed to assure that the measure is properly installed and performing as designed?

Technical Feasibility

Is the proposed measure technically feasible? SB 5X requires that the new Outdoor Lighting Standards are technically feasible. Demonstrate how the proposed measure is technically feasible.

Cost Effectiveness

Is the proposed measure likely to be cost effective? If the measure is a mandatory measure or prescriptive requirement, then it is necessary to demonstrate cost effectiveness. If required, how will the measure be shown to be cost effective? Describe the cost effectiveness methodology in enough detail to estimate the time required and the resources needed to carry it out.

Compliance Documentation

What tools would be needed to quantify energy savings and peak electricity demand reductions? Can these benefits be quantified using the current reference method? What enhancements to the reference method are needed, if any?

Bibliography and Other Research

List and describe in a few sentences the research studies, reports, and personal communications that provide background on the proposed measure. Summarize research that is underway, which addresses the measure. Indicate if data or information will be produced in time to be used in this update of the Standards.

Identify all resources that should be pursued to further investigate this measure. Identify all "experts" that should be involved in further developing the measure, all research and analysis reports and documents that should be reviewed, all industry standards that should be consulted (e.g., Federal Standards, CALTRANS Policies and Standards, Regional or Local Policies or Ordinances, California and National Electrical Code, ASTM, UL, ASHRAE, IESNA, etc.).